

Biological parameters of AD: How to run an efficient digester

FM BioEnergy
Premium Digester Care



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working in partnership with





Feedstock

Source & supply



Silage additives

Minimise losses & increase gas yield



Biological support

Gain control & improve profitability



Process additives

Trace elements, active ingredients & enzymes

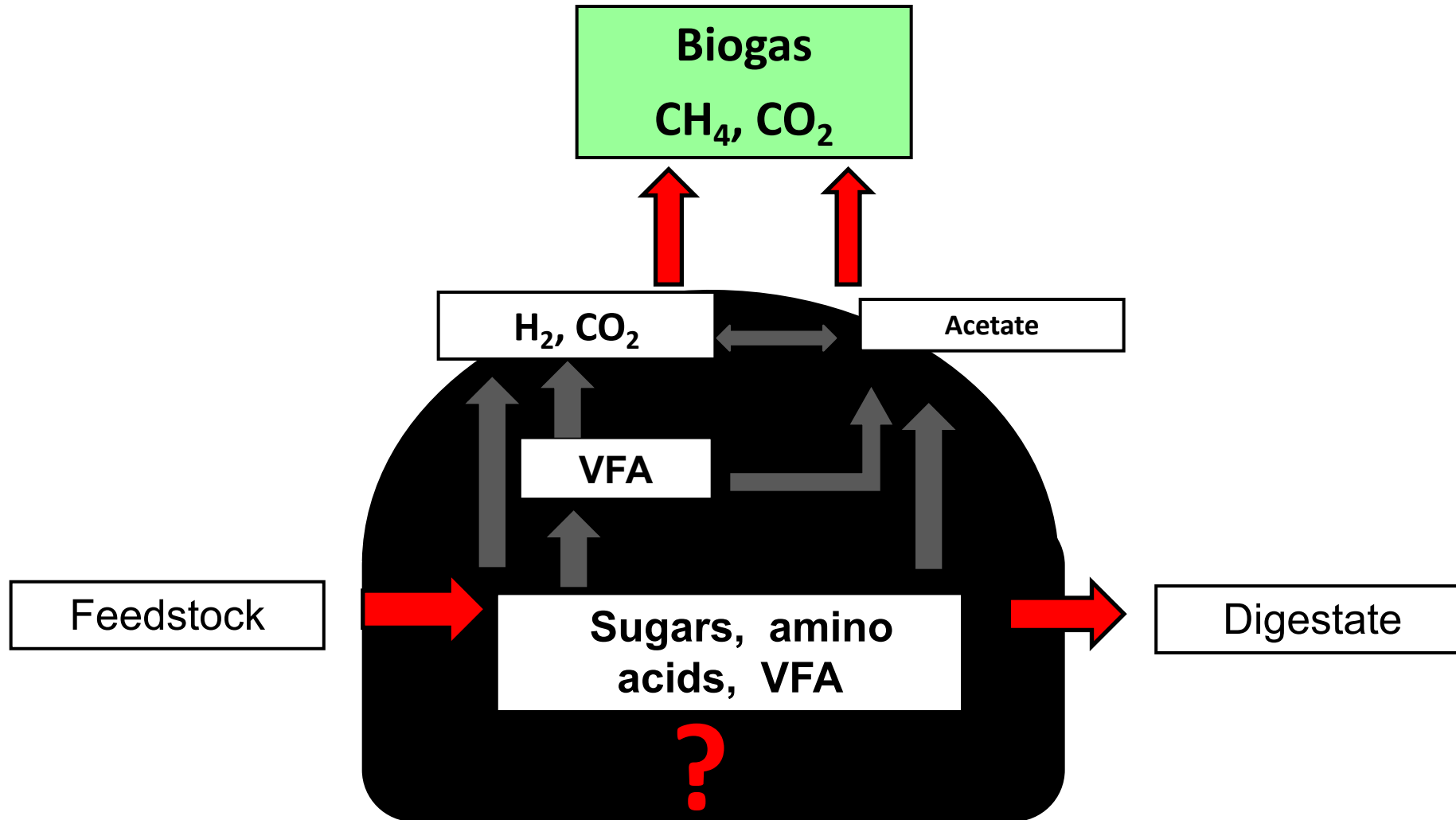


Gas leakage detection

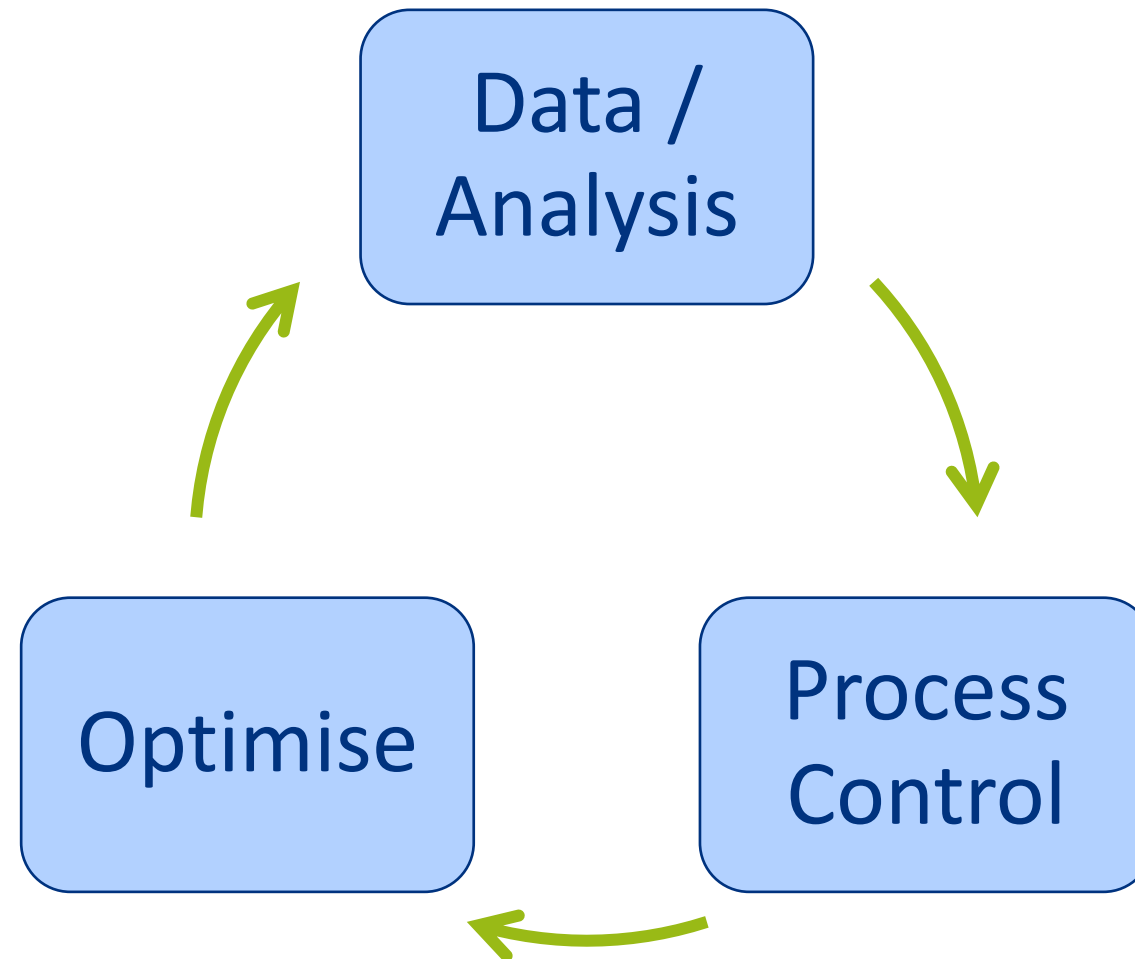
Reduce fugitive emissions & maximise feedstock sustainability



Biogas production



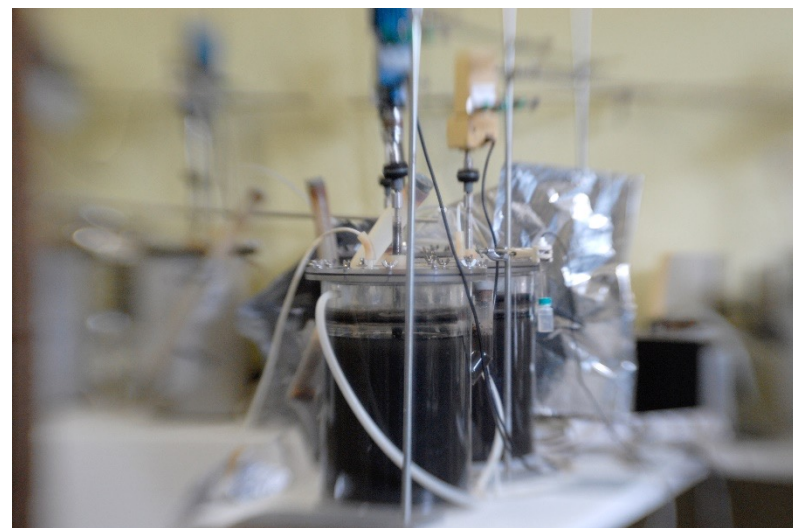
Optimisation Process



On Site Visits and Consultancy

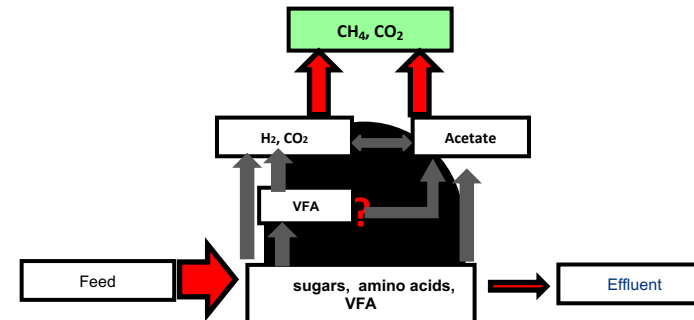


Laboratory Analyses

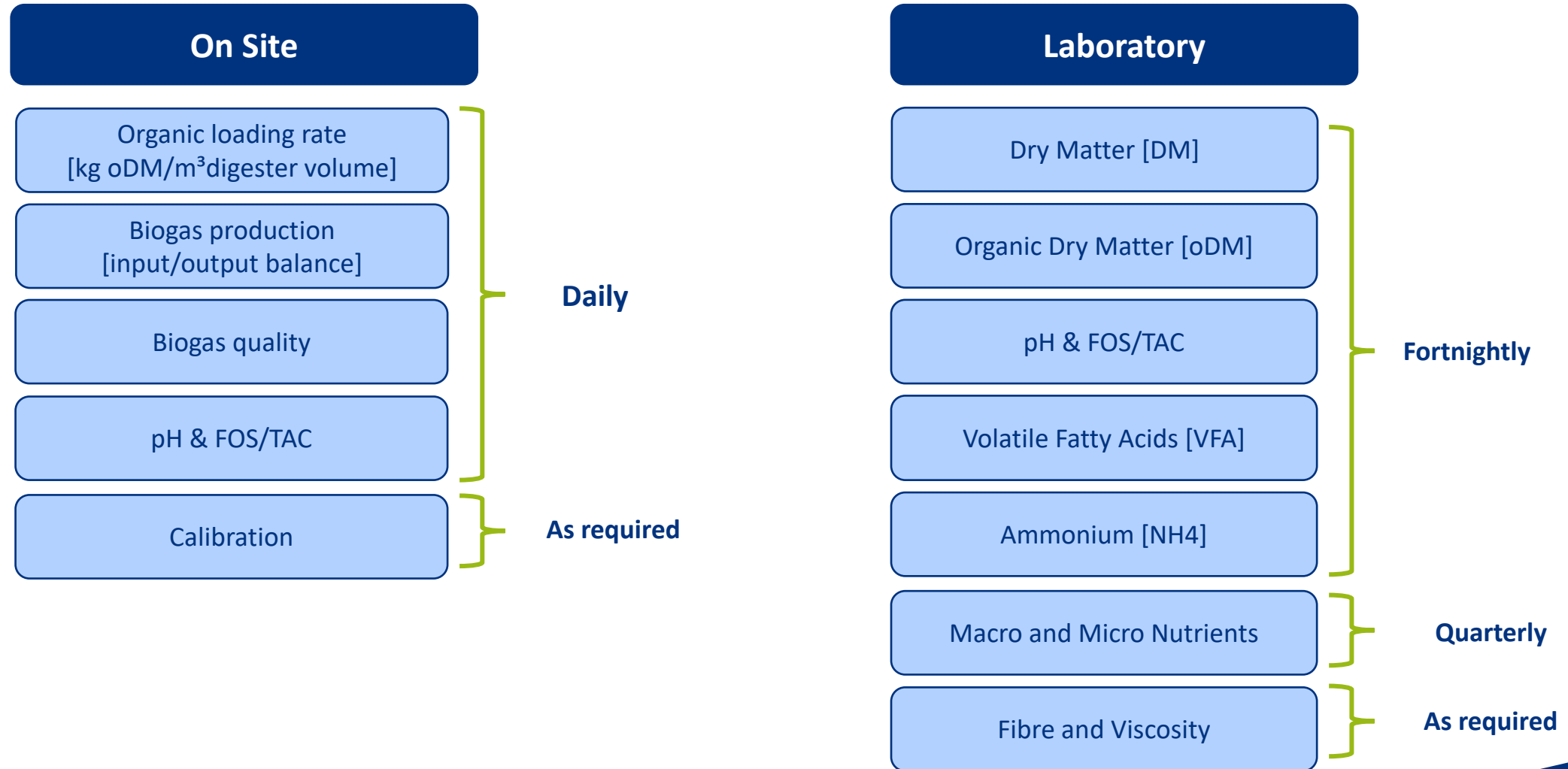


Biological Parameters of Interest

- Dry Matter; DM (oDM) Control Additive
- Temperature Control
- Organic Loading Rate (OLR) Control
- Hydraulic Retention Time (HRT) Control
- Biogas Quality Additive Control
- Nutrients availability Additive
- FOS/TAC Additive Control
- NH_4 levels Additive Control
- pH



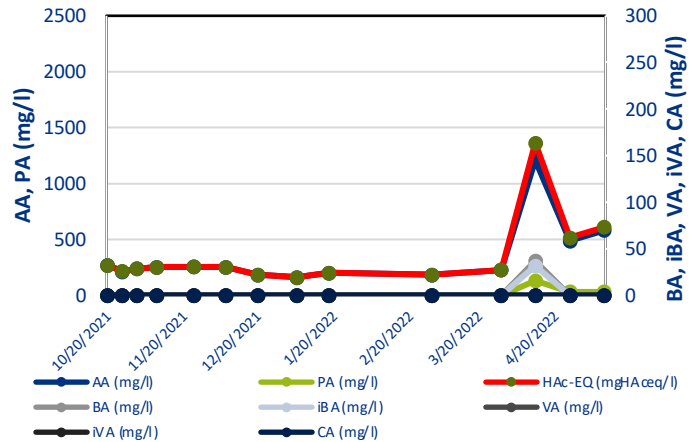
Data / Analysis Required



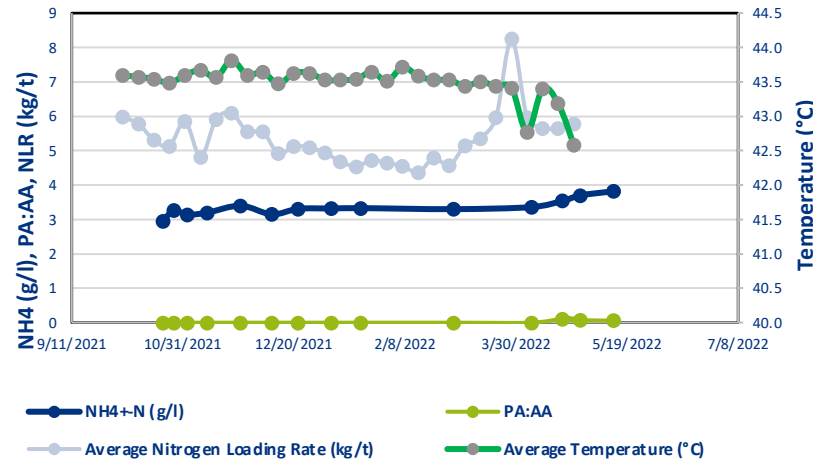
Process control

Sample Receipt	Sampling Date	pH	FOS (gHAc _{eq} /l)	TAC (gCaCO ₃ /l)	FOS/TAC	NH ₄ ⁺ -N (g/l)	DM (g/kg)	oDM (g/kg)	oDM (%)	AA (mg/l)	PA (mg/l)	PA:AA	BA (mg/l)	iBA (mg/l)	VA (mg/l)	iVA (mg/l)	CA (mg/l)	HAc-EQ (mgHAc _{eq} /l)
22-10-2021	20-10-2021	7,9	4,01	18,2	0,22	2,96	73,1	51,2	70,0%	270	<30	N/A	<30	<30	<30	<30	<30	270
27-10-2021	26-10-2021	7,8	3,95	18,6	0,21	3,26	72,9	50,5	69,3%	214	<30	N/A	<30	<30	<30	<30	<30	216
2-11-2021	1-11-2021	8	4,08	18,4	0,22	3,14	71,5	49,7	69,5%	241	<30	N/A	<30	<30	<30	<30	<30	241
11-11-2021	9-11-2021	7,8	4,21	18,4	0,23	3,2	73,6	54,1	73,5%	253	<30	N/A	<30	<30	<30	<30	<30	253
26-11-2021	24-11-2021	7,8	4,3	18,9	0,23	3,4	71,3	49,7	69,7%	256	<30	N/A	<30	<30	<30	<30	<30	256
10-12-2021	7-12-2021	7,8	4,54	18,9	0,24	3,15	75	52,3	69,7%	253	<30	N/A	<30	<30	<30	<30	<30	253
22-12-2021	20-12-2021	7,8	4,75	19,1	0,25	3,31	78,2	54,3	69,4%	185	<30	N/A	<30	<30	<30	<30	<30	185
6-1-2022	5-1-2022	7,9	4,75	19,2	0,25	3,32	84,6	59	69,7%	164	<30	N/A	<30	<30	<30	<30	<30	164
19-1-2022	18-1-2022	7,9	5,09	19,3	0,26	3,33	83,7	57,9	69,2%	202	<30	N/A	<30	<30	<30	<30	<30	202
2-3-2022	1-3-2022	8	4,36	19,7	0,22	3,3	87,5	61,9	70,7%	186	<30	N/A	<30	<30	<30	<30	<30	186
6-4-2022	29-3-2022	7,9	4,57	20,8	0,22	3,36	98,3	68,8	70,0%	229	<30	N/A	<30	<30	<30	<30	<30	229
20-4-2022	12-4-2022	7,8	5,94	21,2	0,28	3,54	109	74,9	68,7%	1210	133	0,10992	37	32	<30	<30	<30	1365
28-4-2022	26-4-2022	8	5,29	22,6	0,23	3,7	105	68,7	65,4%	490	35	0,07143	<30	<30	<30	<30	<30	518
13-5-2022	10-5-2022	7,9	5,14	22,6	0,23	3,82	106	69,9	65,9%	582	35	0,06014	<30	<30	<30	<30	<30	611

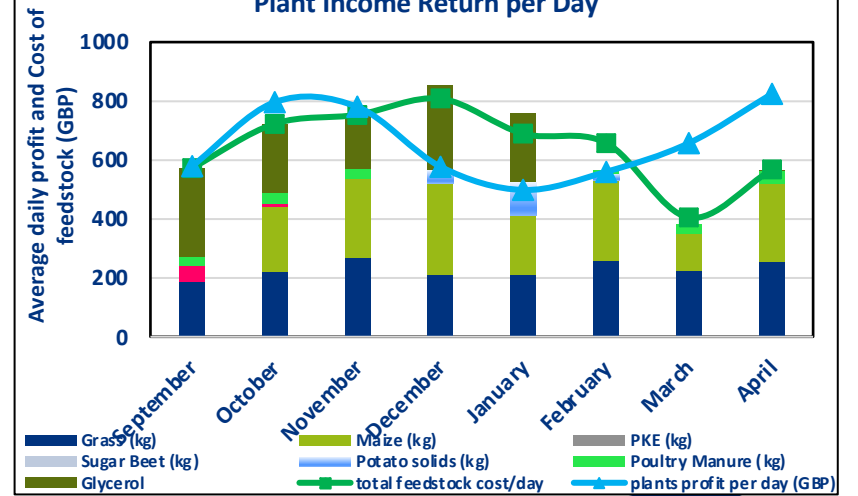
Metabolic Inhibition



Ammonia Toxicity Risk



Plant Income Return per Day



Summary

- Many facets to a continuous, stable process – always keep in mind the 7 important process parameters
 - Temperature
 - Loading rate
 - Produced gas quality
 - Viscosity
 - Inhibitors
 - pH
 - Nutrients
- Be mindful & watch what you feed – Several potential inhibitors
- Monitoring of key parameters
- Additives may be necessary – don't leave it to the last moment

FM **Bíó** **Energy**

Premium Digester Care



Thank you for your attention

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for
farmers
the **total** feed business